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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/253,611	02/19/1999	PAUL A. FARRAR	303.572US1	5827

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EXAMINER

POMPEY, RON EVERETT

ART UNIT	PAPER NUMBER
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2812

DATE MAILED: 02/24/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/253,611

Applicant(s)

FARRAR, PAUL A.

Examiner

Ron E Pompey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 November 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-12,64,68 and 71 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-12, 64, 64, 68, 71 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC ' 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3-12, 64, 65, 68 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cook et al. (US 5,457,345) and in further view of Thomas (US 4,661,375) and Strube et al. (US 4,650,548).

Cook disclose the steps of:

For claims 1, 3-12, 64, 65, 68 and 71:

forming a metal contact pad on a substrate (12, fig. 1);

forming an insulating layer on the metal contact pad (14, fig. 1);

removing a portion of the insulating layer to expose a portion of the metal contact pad, thereby forming an exposed portion of the metal contact pad;

depositing solder (46, fig. 4), wherein at least one material is selected from the group consisting of lead, tin and bismuth, on the exposed portion of the metal contact pad (44, fig. 4) using selective deposition, further comprises depositing solder on the exposed portion of the metal contact pad using a deposition process selected from the group consisting of immersion contact, chemical vapor deposition and electrolytic deposition, thereby forming a solder contact (col. 5, Ins. 1-10 and 37-49); and

annealing the solder contact to form a solder ball contact (col. 1, Ins. 36-44), having a diameter in a range of about 2.5 microns to no greater than 100 microns(col. 2, Ins. 1-5).

3. Cook fails to disclose some or all the limitations of claims 1 and 8-12. However, Thomas discloses the steps of:

For claims 1 and 9-12:

deposition of the solder by immersion.

Strube discloses the steps of:

For claims 1 and 9-12:

electrolytically depositing solder on the exposed portion of the metal contact pad.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the steps disclosed by Strube in Cook, because said immersion and electrolytically deposition methods are other conventional ways to deposit a solder.

4. For claims 1, 8-12 and 71:

further comprises forming an exposed portion of the metal contact pad having a diameter specific diameter;

wherein the insulating layer has a thickness of approximately 1.5 microns; and

wherein the layer of tin has a thickness of approximately 1.42 microns, further wherein the layer of lead and the layer of tin form a solder contact having a thickness of approximately 2.33 microns.

The examiner takes official notice that it is well known in the art and therefore, *prima facie* obvious to incorporate the above limitations of Cook or Thomas and Strube, because they are conventional thickness, diameters and deposition process. Due to the request by the applicant to verify that these limitations are well known Mohsen, 112 or 111, Fig. 1f, column 5, lines 50-65, disclose insulating layer of thickness 1.5 microns and via that is about 1-2 micron.

Response to Arguments

1. Applicant's arguments filed 11-25-02, pertaining to claims 1, 3-12, 64, 65, 68 and 71, have been fully considered but they are not persuasive. The applicant argues that the claims recite that no removable mask is used during the selective deposition of the solder. Whereas the prior art of record does. However, the claims do not mention whether a mask is used or not, it just discloses that solder is selectively deposited only on the exposed portion of the metal contact without depositing solder on the insulating layer and without removing a remaining portion of the insulating layer. Whether a mask is or not placed over the insulating layer is not claimed. Therefore the selective deposition methods disclosed in the prior used in the rejection still read on the claimed invention.

Also, a removable mask is used in the drawings and disclosed in the specification. For example in the figures 5(A) – 5(B) that the applicant point to in his arguments, filed 11-25-02, on page 2, first paragraph, regarding the embodiments showing selective deposition; a photoresist layer 170 is used during the selective

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deposition and removed afterwards, see fig, 5(A) – 5(B), and page 10, lines 15-29 (especially lines 28-29) of the specification.


Conclusion

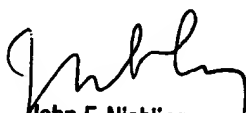
2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ron E Pompey whose telephone number is (703) 305-3016.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


Ron Pompey
Art Unit: 2812
February 5, 2003


John F. Niebling
Supervisory Patent Examiner
Technology Center 2800